

**BEST AVAILABLE COPY**Appl. No. 10/709,175  
Docket No. 146442/REM-0120**REMARKS / ARGUMENTS**

In response to the restriction requirement, Applicant herein elects the invention of Group 1, directed to claims 1-14, without prejudice.

**Status of Claims**

Claims 1-34 stand pending in the application. Claims 1-14 stand rejected. Claims 15-34 stand withdrawn by the Examiner as being drawn to a non-elected invention. Applicant herein elects the invention of Group 1, directed to Claims 1-14, cancels Claims 15-34 without prejudice, and adds new Claim 35, leaving Claims 1-14 and 35 for consideration upon entry of the present Amendment.

Applicant respectfully submits that the rejections under 35 U.S.C. §102(b) and (c) have been traversed, that no new matter has been entered, and that the application is in condition for allowance.

**Rejections Under 35 U.S.C. §102**

Claim 1 stands rejected under 35 U.S.C. §102(c) as being anticipated by Farnworth et al. (U.S. Patent No. 6,710,612, hereinafter Farnworth).

Claims 1, and 8-14 stand rejected under 35 U.S.C. §102(b) as being anticipated by Kawakami et al. (U.S. Patent No. 6,496,162, hereinafter Kawakami).

Claims 1-7, and 9-10 stand rejected under 35 U.S.C. §102(b) as being anticipated by Akram et al. (U.S. Patent No. 6,313,650, hereinafter Akram).

Applicant traverses these rejections for the following reasons.

Applicant respectfully submits that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, *in a single prior art reference.*" *Verdegal Bros. V. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, "[t]he identical invention must be shown in as complete detail as is contained in the \*\*\* claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Furthermore, the single source must disclose all of the claimed elements

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"arranged as in the claim." Structural Rubber Prods. Co. v. Park Rubber Co., 749 F.2d 707, 716, 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. Titanium Metals Corp. v. Banner, 778 F.2d 775, 780, 227 U.S.P.Q. 773, 777 (Fed. Cir. 1985).

Regarding Farnworth

The Examiner alleges that Farnworth anticipates the claimed invention by disclosing each and every element of the claimed invention including an electrically conductive connecting material disposed at the plurality of cavities such that the connecting material connects the plurality of projections to the respective plurality of cavities. Paper 11082004, page 3. However, the Examiner does not state with specificity where in Farnworth such disclosure may be found.

In respectful disagreement with the Examiner, Applicant finds Farnworth to disclose a BGA test socket 31 for use in standard testing and burn-in testing of a BGA die 37 that uses a die contact insert 47, wherein the die contact insert 47 is removable and interchangeable, thereby providing versatility for multiple conductive element array configurations using the same socket 31. Abstract, and Column 3 lines 31-35.

In comparison with the present invention, Applicant finds Farnworth to be absent any disclosure of "*an electrically conductive connecting material* disposed at the plurality of cavities *such that the connecting material connects the plurality of projections to the respective plurality of cavities,*" as specifically claimed in Claim 1 of the instant invention.

Dependent claims inherit all of the limitations of the parent claim.

Applicant submits that since Farnworth is directed to a test device, there is no "electrically conductive *connecting* material", and that the BGA die 37 is "connected" to the insert 47 by way of tongs 35A and 35B (Figures 1 and 8, Column 5 lines 11-27, and Column 7 lines 3-18), and not by an "electrically conductive *connecting* material".

Accordingly, Applicant submits that Farnworth is absent the claimed element of "*an electrically conductive connecting material* disposed at the plurality of cavities *such*

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*that the connecting material connects the plurality of projections to the respective plurality of cavities,"* and therefore cannot be anticipatory.

Absent anticipatory disclosure in Farnworth of each and every element of the claimed invention arranged as in the claim, Farnworth simply cannot be anticipatory.

Regarding Kawakami, Claims 1, 9 and 10

The Examiner alleges that Kawakami anticipates the claimed invention by disclosing each and every element of the claimed invention including an electrically conductive connecting material (col. 3, lines 54-56) disposed at the plurality of cavities such that the connecting material connects the plurality of projections to the respective plurality of cavities. Paper 11082004, pages 3-4.

In respectful disagreement with the Examiner, Applicant finds Kawakami to disclose a LED display unit having a reflection case 30 disposed on a substrate 2, the reflection case 30 having projections 31 that are thermally fused after being passed through holes (not shown) in substrate 2 to form a welded portion 32 for the securement of the reflection case 30 to the substrate 2. Figures 4A and 4B, and Column 3 lines 35-48.

In comparison with the present invention, Applicant finds Kawakami to be absent any disclosure of "*an electrically conductive connecting material* disposed at the plurality of cavities *such that the connecting material connects the plurality of projections to the respective plurality of cavities,*" as specifically claimed in Claim 1 of the instant invention.

Dependent claims inherit all of the limitations of the parent claim.

Applicant submits that since the Kawakami projections 31 are support features that are thermally fused on the back side of substrate 2, there is no disclosure of an "*electrically conductive connecting material*" that "*connects the plurality of projections to the respective plurality of cavities*". The Examiner alleges that the first layer (substrate 2) has a plurality of cavities formed therein, without stating with specificity where such cavities are disclosed. Paper 11082004, page 3. If Applicant accepts that the cavities are the through holes (not shown) for receiving the projections 31, then it follows

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that Kawakami cannot anticipate the claimed invention for the reasons previously stated. If Applicant accepts that the cavities are the three cavities 207G, 207R and 207B (col. 4, line 13), then it follows that Kawakami cannot anticipate the claimed invention because there is no disclosure of *"an electrically conductive connecting material disposed at the plurality of cavities such that the connecting material connects the plurality of projections to the respective plurality of cavities."*

Accordingly, Applicant submits that Kawakami is absent the claimed element of *"an electrically conductive connecting material disposed at the plurality of cavities such that the connecting material connects the plurality of projections to the respective plurality of cavities,"* and therefore cannot be anticipatory.

Absent anticipatory disclosure in Kawakami of each and every element of the claimed invention arranged as in the claim, Kawakami simply cannot be anticipatory.

Regarding Kawakami, Claim 8 Specifically

The Examiner alleges that Kawakami anticipates the claimed invention by disclosing each and every element of the claimed invention including the second layer comprising a diode array having a plurality of backlit photodiodes in electrical communication with the plurality of projections. Paper 11082004, page 4. However, the Examiner does not state with specificity where such disclosure may be found

Applicant respectfully disagrees with the Examiner.

In comparison with the present invention, Applicant finds Kawakami to be absent any disclosure of *"the second layer comprising a diode array having a plurality of backlit photodiodes in electrical communication with the plurality of projections,"* as specifically claimed in Claim 8 of the instant invention.

As best understood by Applicant, the Examiner alleges that Kawakami discloses projections 31. However, Applicant submits that Kawakami does not disclose projections 31 being in electrical communication with a plurality of backlit photodiodes, as claimed.

If Applicant agrees with the Examiner that Kawakami discloses projections 31, then Kawakami cannot anticipate the claimed invention as the Kawakami projections 31 are thermally fused after being passed through holes (not shown) in substrate 2 to form a

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welded portion 32 for the securement of the reflection case 30 to the substrate 2 (Figures 4A and 4B, and Column 3 lines 35-48), and are not in electrical communication with a plurality of backlit photodiodes, as claimed.

Accordingly, Applicant submits that Kawakami is absent the claimed element of "the second layer comprising a diode array having *a plurality of backlit photodiodes in electrical communication with the plurality of projections*," and therefore cannot be anticipatory.

Absent anticipatory disclosure in Kawakami of each and every element of the claimed invention arranged as in the claim, Kawakami simply cannot be anticipatory.

Regarding Akram, Claims 1, 7, 9 and 10

The Examiner alleges that Akram anticipates the claimed invention by disclosing each and every element of the claimed invention including an electrically conductive connecting material (14) disposed at the plurality of cavities such that the connecting material connects the plurality of projections to the respective plurality of cavities. Paper 11082004, page 5.

In respectful disagreement with the Examiner, Applicant finds Akram to disclose an insert testing system that has a layered structure that results a metal line 58 via a metal layer 14 being formed so as to extend into a pit 20 without a breach that would otherwise leave an open circuit during attempted use, the pit 20 being receptive of a solder ball 70 for testing of a CSP 68. Abstract, Figure 8A, Column 8 lines 49-55.

In comparison with the present invention, Applicant finds Kawakami to be absent any disclosure of "*an electrically conductive connecting material* disposed at the plurality of cavities *such that the connecting material connects the plurality of projections to the respective plurality of cavities*," as specifically claimed in Claim 1 of the instant invention.

Dependent claims inherit all of the limitations of the parent claim.

Applicant submits that while solder ball 70 may be an electrically conductive material that makes electrical contact with layer 14 in pit 20, it does not necessarily follow that an electrically conductive material is an electrically conductive *connecting*

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material, and Akram does not disclose solder ball 70 as being a connecting material *such that the connecting material connects (not just contacts) the plurality of projections to the respective plurality of cavities*, as claimed in the instant invention.

Accordingly, Applicant submits that Akram is absent the claimed element of *"an electrically conductive connecting material disposed at the plurality of cavities such that the connecting material connects the plurality of projections to the respective plurality of cavities,"* and therefore cannot be anticipatory.

Absent anticipatory disclosure in Akram of each and every element of the claimed invention arranged as in the claim, Akram simply cannot be anticipatory.

Regarding Akram, Claim 2 Specifically

The Examiner alleges that Akram anticipates the claimed invention by disclosing each and every element of the claimed invention including that the plurality of cavities are formed having a depth  $d$  in the first interface surface, the first interface surface is disposed apart from the second interface surface by a gap  $g$ , and the plurality of projections have a length  $h$  that is equal to or less than the sum of the depth  $d$  and the gap  $g$ , without stating with specificity where such disclosure may be found. Paper 11082004, page 5.

In respectful disagreement with the Examiner, Applicant finds Akram to be absent any disclosure of a depth  $d$ , a gap  $g$ , and a length  $h$ . Absent such disclosure, Applicant submits that Akram necessarily cannot disclose, and therefore cannot anticipate, a length  $h$  that is equal to or less than the sum of the depth  $d$  and the gap  $g$ .

Dependent claims inherit all of the limitations of the parent claim.

Applicant submits that while solder ball 70 may have a length dimension, absent specific disclosure it does not necessarily follow that the plurality of cavities are formed having a depth  $d$  in the first interface surface, the first interface surface is disposed apart from the second interface surface by a gap  $g$ , and the plurality of projections have *a length  $h$  that is equal to or less than the sum of the depth  $d$  and the gap  $g$* , as claimed in the instant invention.

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Accordingly, Applicant submits that absent specific disclosure of each and every element of the claimed invention arranged as in the claim, Akram cannot be anticipatory.

Regarding Akram, Claims 4-6 Specifically

The Examiner alleges that Akram anticipates the claimed invention by disclosing each and every element of the claimed invention including that the plurality of projections have geometrical characteristics as claimed (col. 1, lines 59-60; col. 6, lines 18-28). Paper 11082004, page 5.

In respectful disagreement with the Examiner, Applicant finds Akram to disclose solder balls 70 having a diameter of about 0.3 to 0.4 millimeters (col. 1, lines 59-60), and the depth of pit 20 in the range from about 1 micron to about 300 microns or deeper (col. 6, lines 18-28).

In comparison with the instant invention, Applicant does not find Akram to disclose that:

the plurality of projections have a width  $w$  equal to about 500 microns, as claimed in Claim 4;

the pitch of the plurality of projections is equal to or greater than about 1.1 times the width  $w$  and equal to or less than about 3 times the width  $w$ , as claimed in Claim 5; and

the pitch of the plurality of projections is equal to about 2 times the width  $w$ , as claimed in Claim 6.

Absent such disclosure, Applicant submits that Akram necessarily cannot anticipate each and every element of the claimed invention.

Dependent claims inherit all of the limitations of the parent claim.

Applicant submits that while solder ball 70 may have a diameter, and that while pit 20 may have a depth, absent specific disclosure it does not necessarily follow that Akram has the specific geometrical characteristics arranged as claimed.

Accordingly, Applicant submits that absent specific disclosure of each and every element of the claimed invention arranged as in the claim, Akram cannot be anticipatory.

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**Regarding the Examiner's Reference to In re Yount, 36 C.C.P.A. (Patents)**  
**775, 171 F.2d 317, 80 USPQ 141**

The Examiner comments that some of the claimed limitations are not patentably significant since they relate to the size of the article under consideration which is not ordinarily a matter of invention, and that the Applicant has presented no argument which convinces that the particular geometry of the projections assembly is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for purpose of mounting the fixed assembly to a telescopic boom of a vehicle. Paper 11082004, page 5.

In respectful disagreement with the Examiner, Applicant has commented in the application as filed that some embodiments of the invention may include some of the following advantages: a high packing density of photodiodes on the ceramic substrate with a small spacing therebetween; effective containment of the conductive connecting material to prevent shorting between adjacent diodes; and, stud bumps of a photodiode having a small pitch with respect to the dimension of the photodiode. Paragraph [0024].

Here, Applicant specifically enumerates advantages of the invention that solve problems relating to a high packing density of photodiodes on a ceramic substrate where shorting between adjacent diodes may be problematic that one skilled in the art may not necessarily recognize the claimed solution to, thereby adding patentable weight to the claimed limitations.

In view of the foregoing remarks, Applicant submits that the References do not separately disclose each and every element of the claimed invention arranged as in the claims and therefore cannot be anticipatory. Accordingly, Applicant respectfully submits that the Examiner's rejections under 35 U.S.C. §102(b) and (c) have been traversed, and requests that the Examiner reconsider and withdraw of all of these rejections.



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**BEST AVAILABLE COPY****Regarding New Claim 35**

Applicant has added new Claim 35, which is directed to an electronic assembly similar to that of Claim 1, but in alternative language. Support for Claim 35 may be found in the application as originally filed at Paragraph [0012]. No new matter has been added.

In view of the previous discussion relating to Claims 1-14, Applicant respectfully submits that new Claim 35 is directed to allowable subject matter and respectfully requests entry and notice of allowance thereof.

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The Commissioner is hereby authorized to charge any additional fees that may be required for this amendment, or credit any overpayment, to Deposit Account No. 07-0845.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for extension of time, the Commissioner is requested to grant a petition for that extension of time that is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to the above identified Deposit Account.

Respectfully submitted,

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